

sweetvetch, sainfoin, sesbania, sourclover, sweetclovers, and trefoils.

(1) General description.

(i) Germination habit: Epigeal dicot.

(ii) Food reserve: Cotyledons, which are small and fleshy; they expand and become photosynthetic. The cotyledons of sub clover develop elongated petioles.

(iii) Shoot system: The hypocotyl elongates and carries the cotyledons above the soil surface. The epicotyl usually does not show any development within the test period.

(iv) Root system: A long, tapering primary root, usually with root hairs. Secondary roots may or may not develop within the test period, depending on the kind.

(2) Abnormal seedling description.

(i) Cotyledons:

(A) Less than half of the original cotyledon tissue remaining attached. (Breaks at the point of attachment of the cotyledons to the hypocotyl are common in seeds which have been mechanically damaged. It is important that seedlings not be removed during preliminary counts unless development is sufficient to allow the conditions of the cotyledons to be determined. If the point of attachment of the cotyledons cannot be seen at the end of the test, the seed coat should be peeled back to determine whether a break has occurred.)

(B) Less than half of the original cotyledon tissue free of necrosis or decay.

(ii) Epicotyl:

(A) Missing. (May be assumed to be present if both cotyledons are intact.)

(B) [Reserved]

(iii) Hypocotyl:

(A) Deep open cracks extending into the conducting tissue.

(B) Malformed, such as markedly shortened, curled, or thickened. (Seedlings of sainfoin which have been constricted by growing through the netting of the pod, but which are otherwise normal, are classified as normal.)

(C) Weak and watery.

(iv) Root:

(A) None.

(B) Primary root stubby. (The roots of sweetclovers may be stubby when grown on artificial substrata due to the presence of coumarin in the seed; since this condition usually does not occur

in soil, such seedlings are classified as normal. Roots may appear stubby as a result of being bound by the seed coat; such seedlings are classified as normal. Crownvetch produces phytotoxic effects similar to sweetclovers.)

(C) Split extending into the hypocotyl.

(v) Seedling:

(A) One or more essential structures impaired as a result of decay from primary infection.

(B) Albino.

[59 FR 64503, Dec. 14, 1994, as amended at 65 FR 1708, Jan. 11, 2000]

§ 201.56-7 Lily family, Liliaceae.

Kinds of seed: Asparagus, chives, leek, onion, and Welsh onion.

(a) Asparagus.

(1) General description.

(i) Germination habit: Hypogeal monocot.

(ii) Food reserves: Endosperm which is hard, semi-transparent, and non-starchy; minor reserves in the cotyledon. The endosperm surrounds the entire embryo.

(iii) Cotyledon: A single cylindrical cotyledon; following germination, all but the basal end remains embedded in the endosperm to absorb nutrients.

(iv) Shoot system: The epicotyl elongates and carries the terminal bud above the soil surface. The epicotyl may bear several small scale leaves. A short hypocotyl is barely distinguishable, joining the root to the basal end of the cotyledon. More than one shoot may arise simultaneously, and the seedling may be considered normal if at least one shoot is well-developed and has a terminal growing point, provided other essential structures are normal.

(v) Root system: A long slender primary root.

(2) Abnormal seedling description.

(i) Cotyledon:

(A) Detached from seedling.

(B) Deep open cracks at basal end.

(ii) Epicotyl:

(A) Missing.

(B) Terminal bud missing or damaged.

(C) Deep open cracks.

(D) Malformed, such as markedly shortened, curled, or thickened.

(E) Spindly.

- (F) Watery.
- (iii) Hypocotyl:
 - (A) Deep open cracks.
 - (B) [Reserved]
- (iv) Root:
 - (A) No primary root.
 - (B) Stubby primary root with weak secondary roots.
- (v) Seedling:
 - (A) One or more essential structures impaired as a result of decay from primary infection.
 - (B) Albino.
- (b) Chives, leek, onion, Welsh onion.
- (1) General description.
- (i) Germination habit: Epigeal monocot.
- (ii) Food reserves: Endosperm which is hard, semi-transparent, and non-starchy; minor reserves in the cotyledon.
- (iii) Cotyledon: A single cylindrical cotyledon. The cotyledon emerges with the seed coat and endosperm attached to the tip. A sharp bend known as the "knee" forms; continued elongation of the cotyledon on each side of this knee pushes it above the soil surface. The cotyledon tip is pulled from the soil and straightens except for a slight kink which remains at the site of the knee.
- (iv) Shoot system: The first foliage leaf emerges through a slit near the base of the cotyledon, but this does not usually occur during the test period. The hypocotyl is a very short transitional zone between the primary root and the cotyledon, and is not distinguishable for purposes of seedling evaluation.
- (v) Root system: A long slender primary root with adventitious roots developing from the hypocotyl. The primary root does not develop secondary roots.
- (2) Abnormal seedling description.
 - (i) Cotyledon:
 - (A) Short and thick.
 - (B) Without a definite bend or "knee".
 - (C) Spindly or watery.
 - (ii) Epicotyl:
 - (A) Not observed during the test period.
 - (B) [Reserved]
 - (iii) Hypocotyl:
 - (A) Not evaluated.
 - (B) [Reserved]

- (iv) Root:
 - (A) No primary root.
 - (B) Short, weak, or stubby primary root.
- (v) Seedling:
 - (A) One or more essential structures impaired as a result of decay from primary infection.
 - (B) Albino.

[59 FR 64504, Dec. 14, 1994]

§ 201.56-8 Flax family, Linaceae.

Kind of seed: Flax.

(a) General description.

(1) Germination habit: Epigeal dicot. (Due to the mucilaginous nature of the seed coat, seedlings germinated on blotters may adhere to the blotter and appear to be negatively geotropic.)

(2) Food reserves: Cotyledons which expand and become photosynthetic.

(3) Shoot system: The hypocotyl elongates carrying the cotyledons above the soil surface. The epicotyl usually does not show any development within the test period.

(4) Root system: A primary root, with secondary roots usually developing within the test period.

(b) Abnormal seedling description.

(1) Cotyledons:

(i) Less than half of the original cotyledon tissue remaining attached.

(ii) Less than half of the original cotyledon tissue free of necrosis or decay.

(2) Epicotyl:

(i) Missing. (May be assumed to be present if cotyledons are intact.)

(ii) [Reserved]

(3) Hypocotyl:

(i) Deep open cracks extending into the conducting tissue.

(ii) Malformed, such as markedly shortened, curled, or thickened.

(4) Root:

(i) None.

(ii) Weak, stubby, or missing primary root with weak secondary or adventitious roots.

(5) Seedling:

(i) One or more essential structures impaired as a result of decay from primary infection.

(ii) Albino.

[59 FR 64505 Dec. 14, 1994]